



## **Microbial methane oxidation and chemoautotrophic communities at the North Alex mud volcano, Eastern Mediterranean**

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North Alex mud volcano, located on the upper slope of the western Nile deep-sea fan, is characterized by an active seepage center transporting pore fluids and gases from deep subsurface sources to the sediment-water interface. We sampled different locations between the center and rim of the mud volcano with ROV and multicorer to study the activity of benthic microorganisms involved in aerobic and anaerobic oxidation of methane as well as associated chemoautotrophic communities. Highest methanotrophic activity was found in the mud volcano center, where sediments exhibited high methane and sulfide concentrations. Chemoautotrophic organisms included filamentous sulfur bacteria (*Beggiatoa* spp.) and symbiont bivalves (*Calymene* spp., *Acharax* spp.). In the vicinity of the southern mud volcano rim a large tubeworm field (*Lamellibrachia* spp.) was discovered. The field was associated with authigenic carbonate precipitates and chemoautotrophic bivalves of the family Lucinidae. Abundant ray eggs placed within the tubeworm field as well as the presence of small fish, shrimp and squid indicated that this habitat was utilized as a nursery ground by marine organisms that are not typically related to seepage activity. Preliminary data on benthic microbial methane turnover, geochemical gradients as well as temperature profiles across the sediment-water interface will be presented.